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Maintenance

**REPAIR OF AIRCRAFT ENGINE CRITICAL
PARTS**

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This Instruction implements AFPD 21-1, *Managing Aerospace Equipment Maintenance*. It gives policy and instruction for the repair of aircraft engine critical parts. These policies/instructions shall form the framework for a secure and reliable operation of aircraft engines, develop an AFMC critical parts repair program, develop repair techniques and establish repair sources. It applies to all Air Logistics Centers (ALCs) performing item manager functions for aircraft engines and accessories which come under the definition of an engine critical part. It also applies to the Product Centers responsible for the acquisition of aircraft engines and initial identification of engine critical parts. This instruction does not apply to the Air National Guard or US Air Force Reserve units and members.

SUMMARY OF REVISIONS

This instruction implements the policies set forth in AFPD 21-1.

Chapter 1

POLICIES, PROCEDURES AND RESPONSIBILITIES

1.1. Terms Explained:

1.1.1. Engine Critical Part. A component, because of its use or application, whose failure could result in a catastrophic event, causing extensive weapon system damage and/or loss, extensive maintenance actions, and possible injury to personnel. Additional definitions of component criticality are provided in MIL-STD-1783 "Engine Structural Integrity Program."

1.1.2. Qualified Repair Source. A government agency or contractor which has proven its capability to repair a particular item by satisfactorily completing established qualification requirements.

1.1.3. Qualified Repair Source List. A list of government agencies or contractors qualified to repair a particular item.

1.1.4. Responsible Systems Engineering Authority. This authority resides with the senior engineer (or as delegated to the equipment specialist, item manager, systems or other functional area) supporting the system program director, product group manager, materiel group manager, system support manager or the development support manager.

1.1.5. Qualification Requirement. A government requirement for testing or other quality assurance demonstrations that must be completed before award of a contract.

1.2. Policies for Repair of Aircraft Engine Critical Parts are as Follows:

- Solicitations for the repair of critical parts are based on the following assumptions:
- A need exists for the repair of the part.
- An Air Force approved repair process exists, or one can be developed.
- A qualified repair source exists. Only bids or proposals from qualified repair sources are considered when seeking a repair source. However, the Air Force shall not refuse a contractor's desire to participate in a repair source evaluation as explained in paragraph 1.2.1 and 1.2.2.

1.2.1. Public Law (PL) 98-525 requires the government to document justification for qualification requirements and make these requirements, as well as the costs of testing and evaluation, available to any potential source. Guidance on this policy is contained in AFR 57-7 and FAR 9.2 and its supplements.

1.2.2. Personnel involved with selecting and approving repair sources for critical parts shall be familiar with PL 98-525, FAR subpart 9.2 and its supplements.

1.2.3. The Air Logistic Center Propulsion Management Directorates (ALC/LP) will implement repair processes to repair unserviceable critical parts whenever economies can be realized from the repair or when relief is needed from a supply support deficiency.

1.2.4. Additional repair sources shall be established when the ALC/LP determines:

- Demand exceeds the production capability of existing qualified sources or;
- Existing capability cannot be expanded to meet peace time requirements or industrial mobilization requirements during contingencies or;

- Prohibitive lead times, quality problems, or high costs require a change in repair source or;
- Federal or state environmental laws, policies, or regulations dictate a change in repair process.

1.2.5. When appropriate, the ALC/LP will contact other DoD agencies and commercial users of items common to each for their experience on repair processes or repair sources.

1.2.6. In all cases where an additional repair source is being sought, the procedures outlined in AFMCR 66-48, *Depot Maintenance Posture Planning*, shall be followed.

1.3. Implementation Policies:

1.3.1. Responsible Systems Engineering Authority shall develop/maintain a current list of engine critical parts for which repairs have been approved and a corresponding list of sources authorized to accomplish those repairs. The list of sources shall be provided to ALC/BC.

1.3.2. Repair sources may be removed from the qualified repair source list or be required to requalify when:

- The source has not delivered the item in question within 24 months.
- The source has not had an active repair contract within five years of qualifying.
- There is documented evidence of poor delivery or poor quality performance on the part under review for repair authorization.
- Significant changes in the item or repair process have taken place.

1.3.3. ALC/BC shall be notified when a previously approved repair source has been removed from the qualified repair service list or asked to requalify. The ALC/ BC will advise the repair source of action taken and include substantiating rationale.

1.3.4. Responsible Systems Engineering Authority shall establish realistic standards or requirements for testing and acceptance for both new repair processes and new repair sources. Priority for the development of qualification documents shall be based on anticipated future requirements.

1.4. Responsibilities Defined for the Repair of Aircraft Engine Critical Parts are as follows:

1.4.1. SA-ALC/LR:

- Develops policies and procedures dealing with engine critical parts repair.
- Reviews, interprets and establishes policies/ procedures for specific ALC actions that are not governed by this regulation.

1.4.2. ALC/BC:

- Serves as principle point of contact for source qualification as described in AFMCFARS 5309.2.

1.4.3. Responsible Systems Engineering Authority:

- Develops a program and publish a local instruction to implement the policies outlined in this regulation.
- Determines the need for new repair procedures and initiates appropriate actions.
- Determines the logistical need for additional repair sources and initiates appropriate actions.

- Performs an economic analysis which includes determining the feasibility/cost of developing a repair procedure and/or a source of repair for use in making repair versus replace decisions.
- When appropriate, in conjunction with ALC/BC, contacts engine manufacturers on new repair processes and the qualification requirements for potential repair sources.
- Prepares or acquires the necessary documentation to perform standard testing and inspection/validation of potential repair processes and repair sources.
- Reviews recommendations of repair source approval packages received from ALC/BC and make final approval/disapproval decision.
- Documents all actions taken under this program and ensure that necessary decisions for each step contain the proper level of approval by the appropriate agency.
- Maintains a list of engine critical parts, approved repair processes, and the associated approved repair source(s).
- Establishes local procedures to screen items for possible Expendability Recoverability Reparability Category (ERRC) Code changes according to AFM 67-1, (AFMAN 23-110, pending).

Chapter 2

DEVELOPMENT OF REPAIR PROCESSES

2.1. Development of Repair Processes. A process to repair a critical part will be developed as a result of a shortage of new parts, or when the cost of repairing a used part is significantly lower than the cost of buying a new part. The procedure used to repair a part can originate from several places (e.g. the source of the repair, the prime ALC, the engine manufacturer, etc.). Regardless where the process originates, the Responsible Systems Engineering Authority must control and approve these repair procedures.

2.1.1. Repair processes are usually developed by the engine manufacturer during the initial engine development or at the component improvement and product support conferences. Otherwise, when it is determined that a new repair process is needed, the Responsible Systems Engineering Authority shall:

- Contact selected engine manufacturers.
- Contact selected industrial facilities.
- Contact ALC/BC, who will in turn synopsise the requirement to develop the new repair process.

2.1.2. When a new repair process is developed, an industry or the organic industrial facility may be asked to review, comment, and make recommendations on it. The review should include, at a minimum, repair completeness and adequacy, the extent and nature of any qualifications, hazardous waste considerations, and any special quality control procedures required.

2.1.3. If technical differences arise, the final decision of the Responsible Systems Engineering Authority shall be based on sound engineering principle and judgment.

2.1.4. When a repair process is authorized for repeated application, controls will be established to assure the repetitious repair does not degrade the integrity of the part or the end item.

2.1.5. In all cases of new repair process development, the Responsible Systems Engineering Authority shall be involved in the qualification and approval process.

2.1.6. Appropriate Technical Orders and work specifications will be updated to include the new process.

2.2. Repair Procedures. All proposed repair procedures are processed as follows. Additional steps may be desirable based on the nature of the repair. Initial review will be performed to determine that:

2.2.1. An economic or logistical need exists.

2.2.2. The process is described in sufficient detail with complete data if owned by the government or via specification or process number if proprietary to a prospective contractor, to ensure complete and proper accomplishment by the repair source.

2.2.3. Critical procedural steps, dimensions, and processes are adequately described and emphasized.

2.2.4. Process quality control checks are specified as needed.

2.2.5. The government possesses unlimited rights to any technical data it supplies to a current/potential repair source.

- 2.2.6. The necessary source qualification requirements and attendant costs are documented.
- 2.2.7. The proposed process can be adequately tested and substantiated prior to approval or release.
- 2.2.8. If required, a method shall be developed to identify and track items repaired by the process.
- 2.2.9. Hazardous chemical usage is minimized and/or eliminated.

Chapter 3

ESTABLISHMENT AND QUALIFICATION OF REPAIR SOURCES

3.1. Establishment and Qualification of Repair Sources. When the Air Force seeks contractors to provide repaired critical engine items, only contractors on the qualified repair source list will be solicited. The Air Force will not refuse a contractor's desire to submit and have evaluated a source approval request package.

3.1.1. As part of the qualification requirement, a contractor who desires to be qualified will be provided with substantiation tests commensurate with the level of confidence established. Upon successful completion of the required substantiation testing, the contractor will be listed on the qualified repair source list.

3.1.2. Qualified repair sources that have delivered a specific item within 24 months preceding contract solicitation, will be considered as qualified and their overall performance will be reviewed by the Responsible Systems Engineering Authority.

3.2. Initial Review. Before considering a new repair source for the repair of engine critical parts, the Responsible Systems Engineering Authority as a minimum, will ensure that:

3.2.1. An Air Force approved technical standards document is prepared. It will include test, measurement, and inspection criteria and also contain the qualification and quality control acceptance requirements.

3.2.2. A statement of work has been prepared which includes conditions to be inspected, serviceable limits, repairable limits, and corrective action required for each condition.

3.2.3. A database to evaluate the prescribed tests.

3.3. Establishment of a Repair Source:

3.3.1. Responsible Systems Engineering Authority will establish pertinent qualification requirements which potential sources must satisfy including substantiation testing.

3.3.2. Responsible Systems Engineering Authority will give potential sources the opportunity to qualify upon request and furnish these potential sources with the necessary qualification information including:

- Identification of the component.
- Detailed repair procedure and/or statement of work.
- Testing standards to which sample repair parts will be subjected.
- Estimated cost of qualification.
- Name and address of activity to be contacted if questions arise.

3.3.3. In special circumstances, the engine manager may provide repairable parts to the prospective sources after they have satisfied preliminary qualification requirements.

3.4. Unsolicited Proposals. An unsolicited proposal is a unique and innovative written offer submitted to an agency on the initiative of the offeror for the purpose of obtaining a contract with the government

and which is not in response to a formal or informal request. Unsolicited offers which propose a new process/procedure for repairing an aircraft engine critical part are considered unsolicited proposals. Unsolicited proposals will be processed IAW FAR 15.5, as supplemented, and AFMCPAM 64-101, *Unsolicited Proposal Guide*. Qualification will be based on the same standards and guidelines as those applicable to solicited sources. Requests from contractors seeking an opportunity to become a qualified source of repair, using existing repair processes/procedures, are considered Source Approval Requests (SARs) and will be processed IAW FAR 9.2, as supplemented.

3.5. Qualified Repair Sources. A potential repair source will be considered qualified for inclusion on the qualified repair source list when:

3.5.1. They have satisfied the qualification requirements including successful completion of substantiation tests prescribed by the Responsible Systems Engineering Authority.

3.5.2. The experience of the engine manufacturer, other DoD agencies, or commercial contractors with the potential repair source is satisfactory. Responsible Systems Engineering Authority must evaluate repair source capabilities and be satisfied that the potential repair source meets Air Force standards.

3.6. Notifications. Repair sources will be notified in writing by the ALC/BC of the Responsible Systems Engineering Authority's determination regarding qualification or nonqualification to repair a particular part.

3.7. Documentation.

3.7.1. A qualified repair source list will be maintained by the applicable ALC/LPs engineering branch and distributed to ALC/BC as it is updated. The qualified repair source list will contain the following minimum information:

- Identification and description of the part.
- Description of the repair and identification of the repair process document.
- Name and address of currently qualified repair sources.
- Date of qualification of the repair source.

3.7.2. ALC/LPs will retain records with a detailed description of the criteria that were used to select the repair source(s) for the particular engine critical part.

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